

## **Claim**

What I claim as my invention is:

-1) An internal combustion engine of open closed cycle and binary fluid comprising:

a dry air filter for cleaning aspired atmospheric air;

a water injector twin screw compressor that compresses air and pumps water, oil-free, in a single stage, with air flow from 10 percent up to 100 percent, air pressure ratio from 4:1 up to 20:1;

a high-pressure water separator to remove the water at high pressure from the compressed air;

a high-pressure side regenerator, for recuperative heating of the compressed air;

a first combustor to burn different types of liquid or gaseous fuels for heating the preheated compressed air in a continuous combustion;

a first twin screw expander with fixed expansion ratio for a first expansion stage of hot gasses from the first combustor at constant maximum peak temperature, the first twin screw expander drives the compressor;

a damper, for regulating the amount of hot gasses being delivered into the second combustion chamber, and bypassing the hot gasses to a regenerative catalytic reactor;

a second combustor burning different types of liquid or gaseous fuels for reheating the hot gasses and steam injected in a continuous combustion, the fuel injected in the second combustor and the steam

injected are cut off simultaneously in idle run;

a second twin screw expander with fixed expansion ratio for a second expansion stage of hot gasses and steam from the second combustor at constant maximum peak temperature, this second twin screw expander has an output power shaft;

a regenerative catalytic converter and thermal reactor recovers heat increasing the temperature of exhaust gasses by means of the post combustion of hydrocarbon and carbon monoxide and reducing the nitrogen oxides;

a low-pressure regenerator, wherein the hot exhaust gasses is cooled and the water vapor is condensed;

a steam separator wherein the high-pressure steam coming out of the first and second twin screw expanders is injected;

a water ejector combining a high-pressure fluid with a low-pressure fluid to form an intermediate-pressure fluid supply;

a condenser, recovering water from the exhaust gasses and steam;

a low-pressure water separator, wherein the injected water and the water are generated by combustion is removed from the exhaust gasses, and then the exhaust gasses are discharged right to the atmosphere;

an insulated water tank having a filter for the solid removal and to neutralize oxides, acid and sulfur dioxide;

a water pump transfer water from the insulate water tank to a cooler, the water being supplied through a water injector to cool down the water-injection twin compressor;

a water flow control, water flow from the high-pressure water separator being supplied to the first twin-screw expander and the second twin-screw expander;

a steam injector in the damper controlling hot gasses to be delivered to the second twin-screw expander.--

A handwritten signature in black ink, appearing to read 'Lelio Dante Greppi', with a stylized flourish at the end.

Lelio Dante Greppi